

WHAT IS CLAIMED IS:

1. An image scanning apparatus comprising:

a movable image sensing unit that scans at least one document image arranged on a document plate while moving relative to the at least one document image; and

a controller that controls the relative movement between said image sensing unit and the at least one document image such that when plural document images arranged on the document plate are scanned, the relative movement is temporarily stopped after completion of scanning one of the plural document images and before starting scanning a next of the plural document images.

2. An image scanning apparatus according to claim 1, wherein said controller moves said image sensing unit to a home position after the relative movement is temporarily stopped.

3. An image scanning apparatus according to claim 1, wherein said controller moves said image sensing unit in a direction opposite to a sub-scanning direction a particular distance after the relative movement is temporarily stopped.

4. An image scanning apparatus according to claim 3,

wherein the particular distance is calculated from at least one of a scanning speed, a scanning resolution, a space between documents in a sub-scanning direction, and a minimum distance needed to accelerate said image sensing unit to the scanning speed.

5. An image scanning apparatus according to claim 3, wherein said controller moves said image sensing unit in the direction opposite to the sub-scanning direction when at least one of (i) the plural document images overlap in the direction of the relative motion between said image sensing unit and the document images, and (ii) a larger distance is needed between the document images to accelerate said image sensing unit to a necessary speed.

6. An image scanning apparatus according to claim 2, wherein said controller moves said image sensing unit to the home position after each document image is read when an operation mode requires that calibration data be acquired each time a document image is scanned.

7. An image scanning apparatus according to claim 1, wherein the document images are a plurality of frames of images formed on a photographic film.

8. An image scanning apparatus comprising:

a movable image sensing unit that scans at least one document image arranged on a document plate while moving relative to the at least one document image; and

a controller that controls the relative movement of said image sensing unit such that when plural document images arranged on the document plate are scanned, said controller moves said image sensing unit a particular distance in a direction opposite to a sub-scanning direction after completion of scanning one of the plural document images and before starting scanning a next of the plural document images.

9. An image scanning apparatus according to claim 8, wherein said controller moves said image sensing unit in the direction opposite to the sub-scanning direction to a home position.

10. An image scanning apparatus according to claim 8, wherein the particular distance is calculated from at least one of a scanning speed, a scanning resolution, a space between documents in a sub-scanning direction, and a minimum distance needed to accelerate said image sensing unit to the scanning speed.

11. An image scanning apparatus according to claim 8, wherein said controller moves said image sensing unit in the direction opposite to the sub-scanning direction when at least one of (i) the one and next document images overlap in the direction of the relative movement between said image sensing unit and the document images, and (ii) a larger distance is needed between the one and next document images to accelerate said image sensing unit to a scanning speed.

12. An image scanning apparatus according to claim 9, wherein said controller moves said image sensing unit to the home position when an operation mode requires that calibration data be acquired each time a document image is scanned.

13. An image scanning apparatus according to claim 8, wherein the document images are a plurality of frames of images formed on a photographic film.

14. An image scanning apparatus comprising:  
a movable image sensing unit that scans one or more document images by moving relative to the document images;  
and

a controller that controls the movement of said image sensing unit such that said image sensing unit moves a

minimum distance when the document images are scanned.

15. An image scanning apparatus according to claim 14, wherein said at least one document image is plural frames of images formed on a photographic film.

16. A control program for controlling an image scanning apparatus to scan one or more document images arranged on a document plate while moving an image sensing unit relative to the document images, the control program comprising the step of:

controlling the movement of the image sensing unit such that the relative movement is temporarily stopped after completion of scanning one of the document images arranged on the document plate and before scanning a next of the document images.

17. A control program according to claim 16, wherein in the control step, the image sensing unit is moved to a home position after the relative movement is temporarily stopped.

18. A control program according to claim 16, wherein in the control step, the image sensing unit is moved a particular distance in a direction opposite to a sub-

scanning direction after the relative movement is temporarily stopped.

19. A control program according to claim 18, wherein the particular distance is calculated from at least one of a scanning speed, a scanning resolution, a space between documents in a sub-scanning direction, and a minimum distance needed to accelerate the image sensing unit to the scanning speed.

20. A control program according to claim 18, wherein in the control step, the image sensing unit is moved in the direction opposite to the sub-scanning direction when at least one of (i) the one and next document images overlap in the direction of the relative movement between the image sensing unit and the document images, and (ii) a larger distance is needed between the one and next document images to accelerate the image sensing unit to a scanning speed.

21. A control program according to claim 17, wherein the image sensing unit moves to the home position when an operation mode requires that calibration data be acquired each time a document image is scanned.

22. A control program according to claim 16, wherein

the document images are plural frames of images formed on a photographic film.

23. A computer-readable storage medium on which a control program according to claim 16 is stored.

24. A control program for controlling an image scanning apparatus to scan one or more document images arranged on a document plate while moving an image sensing unit relative to the document images, the control program comprising the step of:

controlling the relative movement of the image sensing unit such that the image sensing unit is moved a particular distance in a direction opposite to a sub-scanning direction after completion of scanning a first of the document images arranged on the document plate and before scanning a next of the document images.

25. A control program according to claim 24, wherein in the control step, the image sensing unit is moved in the direction opposite to the sub-scanning direction to a home position.

26. A control program according to claim 24, wherein the particular distance is calculated from at least one of a

scanning speed, a scanning resolution, a space between documents in a sub-scanning direction, and a minimum distance needed to accelerate the image sensing unit to the scanning speed.

27. A control program according to claim 24, wherein in the control step, the image sensing unit is moved relatively backwardly when at least one of (i) the one and next document images overlap in the direction of the relative motion between the image sensing unit and the document images and (ii) a larger distance is needed between the one and next document images to accelerate the image sensing unit to a scanning speed.

28. A control program according to claim 25, wherein the image sensing unit is moved to the home position when an operation mode requires that calibration data be acquired each time a document image is scanned.

29. A control program according to claim 24, wherein the document images are plural frames of images formed on a photographic film.

30. A computer-readable storage medium on which a control program according to claim 24 is stored.



31. A control program for controlling an image scanning apparatus to scan one or more document images while moving an image sensing unit relative to the document images, the control program comprising the step of:

controlling the relative movement of the image sensing unit such that the image sensing unit moves a minimum distance to scan all of the document images.

32. A control program according to claim 31, wherein the document images comprise plural frames of images formed on a photographic film.

33. A computer-readable storage medium on which a control program according to claim 31 is stored.

34. A scanning method comprising the steps of:

scanning a plurality of document images arranged on a document plate while moving an image sensing unit relative to the plurality of document images; and

controlling the relative movement of the image sensing unit such that the relative movement is temporarily stopped after completion of scanning one of the plurality of document images arranged on the document plate and before scanning a next of the plurality of document images.

35. A scanning method according to claim 34, wherein in the controlling step, the image sensing unit is moved to a home position after the relative movement is temporarily stopped.

36. A scanning method according to claim 34, wherein in the controlling step, the image sensing unit is moved a particular distance in a direction opposite to a sub-scanning direction after the relative movement is temporarily stopped.

37. A scanning method according to claim 36, wherein the particular distance is calculated from at least one of a scanning speed, a scanning resolution, a space between documents in a sub-scanning direction, and a minimum distance needed to accelerate the image sensing unit to the scanning speed.

38. A scanning method according to claim 36, wherein in the control step, the image sensing unit is moved in the direction opposite to the sub-scanning direction when at least one of (i) the one and next document images overlap in the direction of the relative movement between the image sensing unit and the document images, and (ii) a larger

distance is needed between the one and next document images to accelerate the image sensing unit to a scanning speed.

39. A scanning method according to claim 35, wherein the image sensing unit is moved to the home position when an operation mode requires that calibration data be acquired each time a document image is scanned.

40. A scanning method according to claim 34, wherein the document images are plural frames of images formed on a photographic film.

41. A scanning method comprising the steps of:

scanning a plurality of document images arranged on a document plate while moving an image sensing unit relative to the plurality of document images; and

controlling the relative movement of the image sensing unit such that the image sensing unit is moved a particular distance in a direction opposite to a sub-scanning direction after completion of scanning a first of the plurality of document images arranged on the document plate and before scanning a next of the plurality of document images.

42. A scanning method according to claim 41, wherein in the controlling step, the image sensing unit is moved in

the direction opposite to the sub-scanning direction to a home position.

43. A scanning method according to claim 41, wherein the particular distance is calculated from at least one of a scanning speed, a scanning resolution, a space between documents in a sub-scanning direction, and a minimum distance needed to accelerate the image sensing unit to the scanning speed.

44. A scanning method according to claim 41, wherein in the controlling step, the image sensing unit is moved relatively backwardly when at least one of (i) the one and next document images overlap in the direction of the relative motion between the image sensing unit and the document images and (ii) a larger distance is needed between the one and next document images to accelerate the image sensing unit to a scanning speed.

45. A scanning method according to claim 42, wherein the image sensing unit is moved to the home position when an operation mode requires that calibration data be acquired each time a document image is scanned.

46. A scanning method according to claim 41, wherein

the document images are plural frames of images formed on a photographic film.

47. A scanning method comprising the steps of:

scanning a plurality of document images while moving an image scanning sensing unit relative to the plurality of document images; and

controlling the relative movement of the image sensing unit such that the image sensing unit moves a minimum distance to scan all of the document images.

48. A control program according to claim 47, wherein the document images comprise plural frames of images formed on a photographic film.